How To Troubleshoot Integrated Brake Controllers

Technological advancements are constantly outpacing diagnostic solutions in the automotive industry causing frustration for shops and customers alike. The Integrated Trailer Brake Controllers (ITBC) now found on virtually all pickups and SUVs with a tow package must detect the presence of a trailer to activate lights and brakes, as opposed to the older, simpler aftermarket controllers. The purpose of this article is to better explain these new systems and the tools needed to work on them.

When working properly, ITBCs provide a superior towing experience by modulating the power and timing to the trailer brakes based upon inputs from vehicle brake pressure and speed sensors. They also have built-in diagnostics via load detection through the trailer electric brake circuit. If the CORRECT load is sensed, power will be sent to the trailer circuit when the brake pedal is pressed. If there's no load or the wrong load signature is detected, no power is sent or it's removed.

But not all ITBCs are created equal. Each manufacturer has their own process for determining connectivity. Understanding how the various systems work makes all the difference for a successful repair and positive customer experience.

The following are a few examples of useful information for anyone servicing these vehicles:

#1: Several makes of vehicles automatically limit the output gain if the vehicle is parked, regardless of the user input settings. This is indicated when the technician puts the output all the way up, then checks the voltage at the pin and still gets a low voltage reading. This "False Failure" often leads to trucks being mislabeled as faulty due to a false assumption.

#2: Some vehicles run a continuous discovery pulse to the brake circuit to determine brake connection status. This can be both helpful and dangerous. For instance, while driving, if the vehicle detects the trailer is no longer connected, the ITBC could disconnect power to the brakes. The problem may be the truck, pin connection, faulty brake magnet or an intermittent ground loss. It's also important to note that not all makes and models use the same discovery protocol.

#3: Some manufacturers use trailer detection technology on circuits other than the electric brake circuit, such as 12V aux, left/right turn signals, etc. To verify proper operation and troubleshoot problems, you need the right tools to activate these circuits.

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